



Project: **FP100 Field programmer**

Title: **Users Manual**

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## **Introduction**

### Description

This FP100 System manual is a reference of use for the boards functionality and installation of necessary drivers and software.

### Document history

Date	Id.	Description
040218	DTU	Original version
040219	DTU	Released under number 0516201
040510	RKN	Released under number 0525301
060327	MUR	Added: warning power off before disconnecting, warning about dialogues being target specific, warning about cable strain relief.
060424	RBA	Moved to new lay-out (OpenOffice 2.0)
060425	MUR	Released under number 0591500
070426	RKN	Added incremental programming mode
070426	RKN	Released under number 0632400
161108	CME	Updated setup information
161108	CME	Released under number 0980800

## **Getting started**

### Contents of the kit

- FP100.
- USB-cable (type A to type B, approximately 1.5m).

### Minimum system requirements

- Pentium processor based PC.
- 64MB RAM memory
- Windows95, or higher, operating system.
- USB interface.
- Mouse.

### Programmer tool installation

The FP100 is delivered without software. Please download application software from the [actum.com](http://actum.com) website. The application setup will automatically install the needed drivers.

Download *FP100setup.exe* from [www.actum.com](http://www.actum.com).

Run the *FP100setup.exe* file with the help of the Windows explorer. Follow the instructions given on the screen to install the programmer software.

### Checking the programmer tool installation.

You can check to see if the programmer software is installed correctly in the following way:

- Click on the "Start" icon on the task bar.
- A pop-up menu appears. Click on "Programs". A list of the available programs on the computer appears.
- When this list includes the "FP100 programmer", the installation has been completed successfully.

### **FP100 programmer tool.**

When the drivers and software are installed, as described in the previous chapter, the "FP100 programmer tool" can be started and used.

This tool enables the user to upload the software into the target device. This can be done in two different modes.

- **Wired mode**  
In "wired mode" the target device can be programmed by using a PC to control the FP100 programmer. The first step in "wired mode" is uploading the software into the FP100 programmer. The second step is programming the target device. These two steps are build-in functions of the "FP100 programmer tool".

- Detached mode

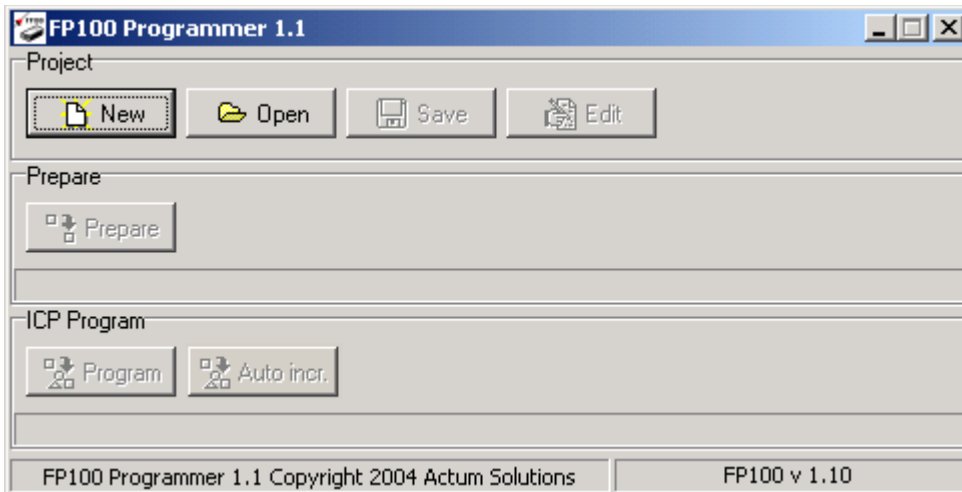
In “detached mode” the target device can be programmed without the need of a PC. The first step is to prepare the FP100 programmer by uploading the software into the programmer. After this step the FP100 can be disconnected from the PC. Now the FP100 can be “walked, shipped or handed-over” to anyone. The target device can now be programmed without the need of a PC.

In the following paragraphs the usage of the “FP100 programmer tool” in these different modes is given and illustrated with screen shots.

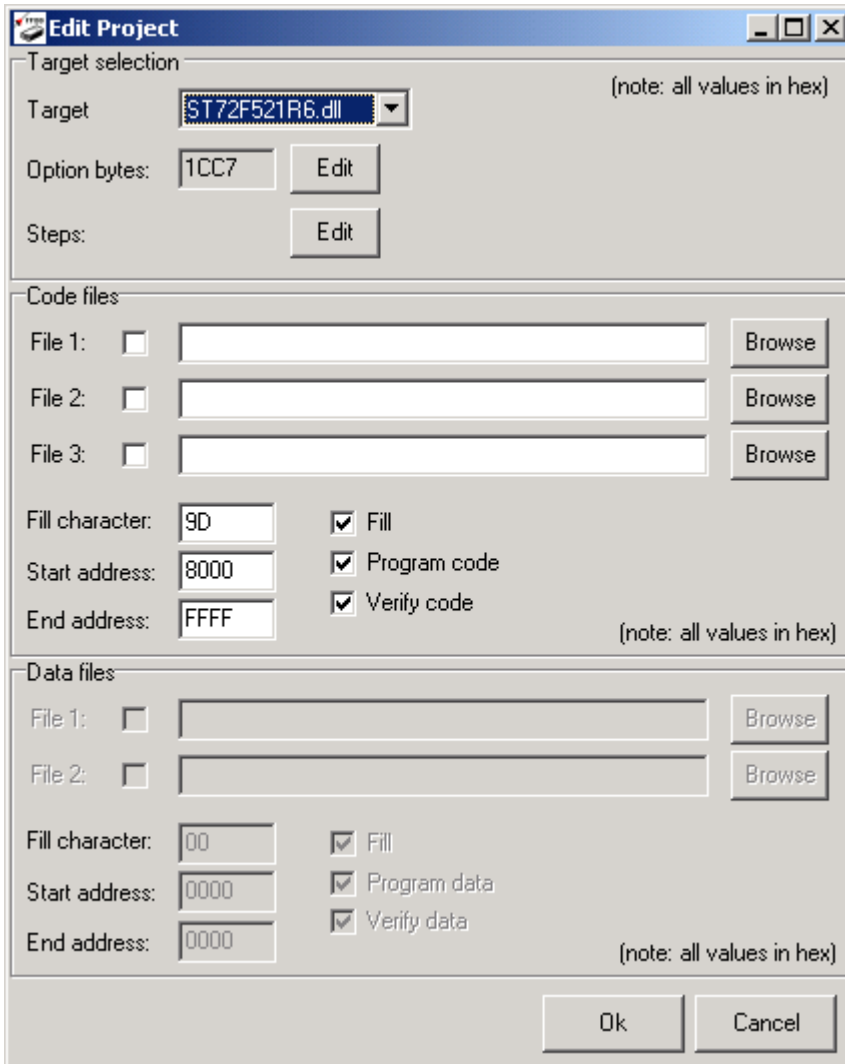
### Step 1: Project creating/opening stage.

Before a target device can be programmed with the FP100, the data file and option byte has to be defined.

This is done by creating a new project file (clicking “New”) or opening (clicking “Open”) an existing project file.



When a new project file has to be created, the following window appears:



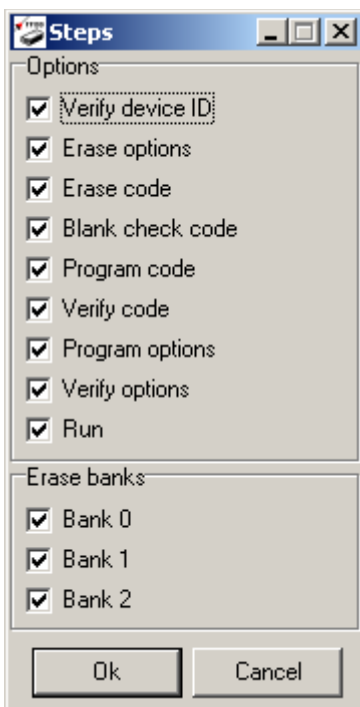
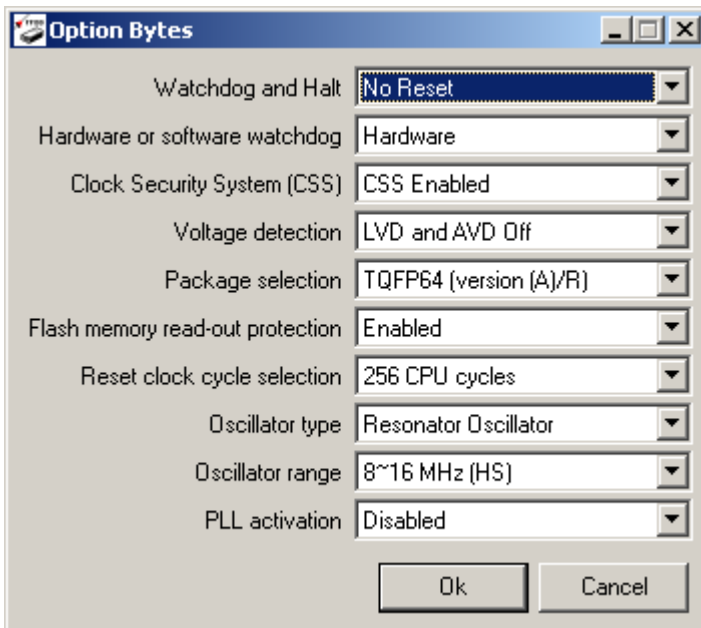
The screenshot shows the 'Edit Project' dialog box with the following fields and options:

- Target selection:**
  - Target:  (note: all values in hex)
  - Option bytes:
  - Steps:
- Code files:**
  - File 1:
  - File 2:
  - File 3:
  - Fill character:   Fill
  - Start address:   Program code
  - End address:   Verify code (note: all values in hex)
- Data files:**
  - File 1:
  - File 2:
  - Fill character:   Fill
  - Start address:   Program data
  - End address:   Verify data (note: all values in hex)

Buttons:

In this window the target device, option byte, programming steps, code files and data files can be defined.

The option bytes and programming steps are device dependent. The dialog box of the option byte and programming steps is shown in the figures below (typical for the ST72F521).



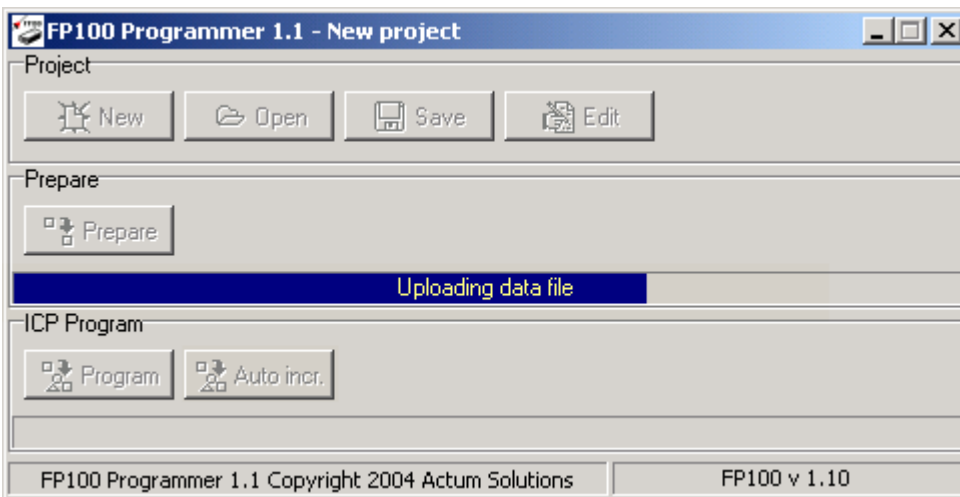
The settings of the "option bytes" and "programming steps" are set to a default value when creating a new project. By default, all the program steps are enabled.

After browsing to and selecting the correct data file, the "Edit project" dialogue can be closed and the project can be saved for future use. Now the tool is ready for programming.

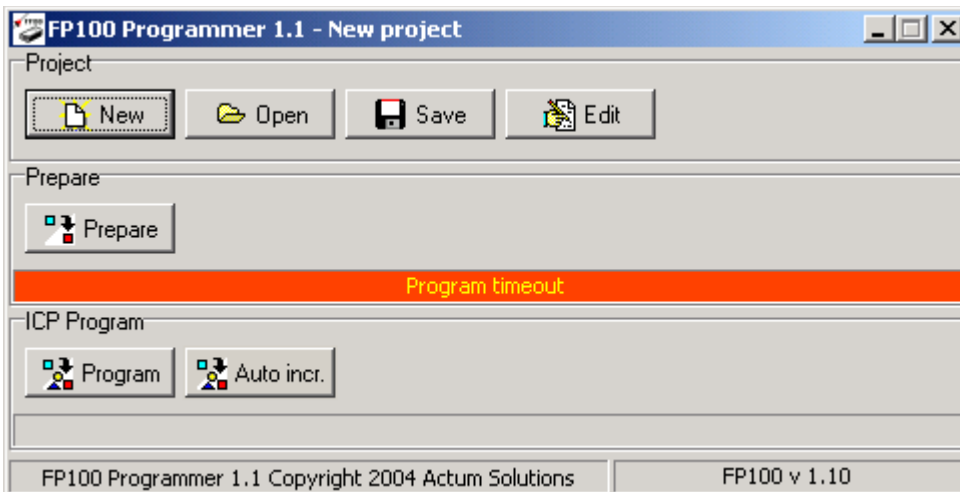
### Step 2: Prepare stage.

In this stage, the selected data file(s) and option byte(s) are programmed into the memory of the FP100.

This is done by pressing the “Prepare” icon. The progress of the upload is shown in the progress bar, as illustrated in the following windows.



The previous window shows a successful upload of the target software into the FP100. When an error occurred during this programming stage, it will be illustrated as follows.



This can mean that the FP100 is not installed correctly. Reinstall the drivers, as described in the previous chapter, to solve this problem.

### Step 3: ICP programming stage.

In this step the target device is programmed with the software that has been uploaded into the FP100 (see step 2).

**WARNING:** remove power from target board when connecting or disconnecting the FP100.

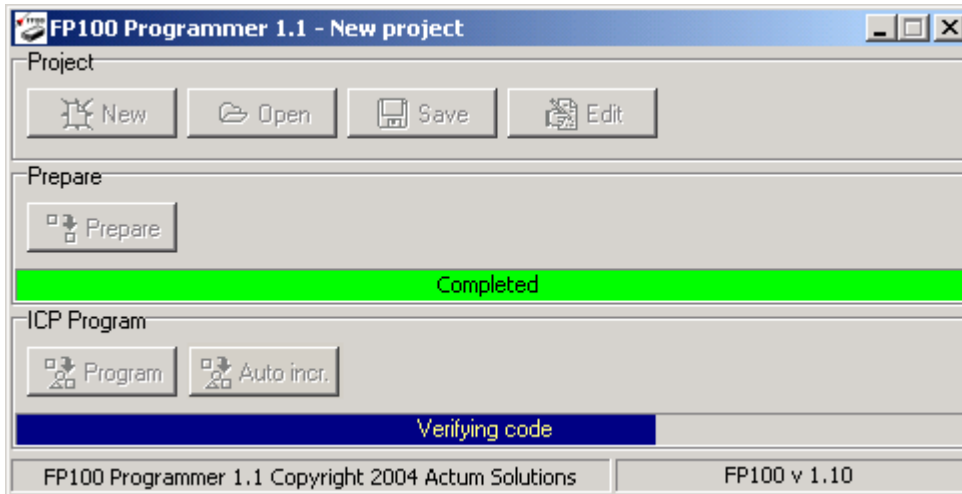
**DO NOT** disconnect the connector by pulling the flatcable.



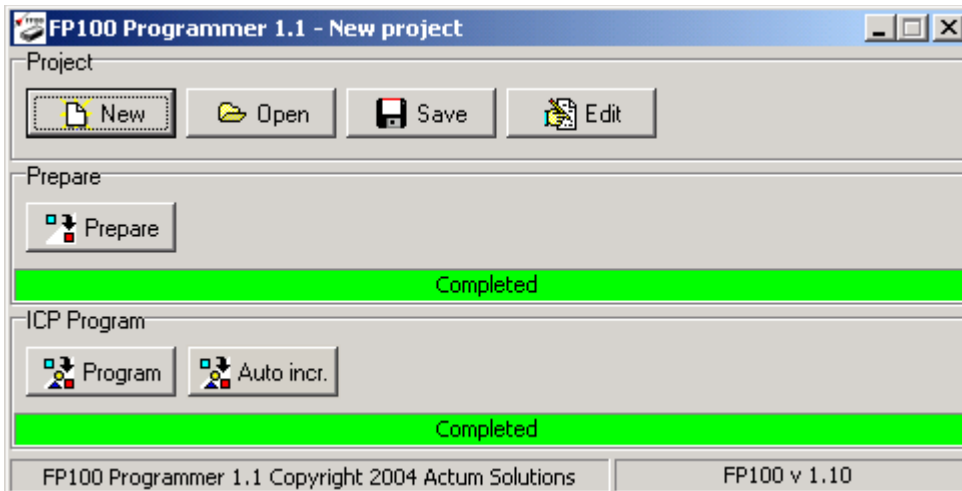
## Wired mode programming

In the wired mode, the target device can be ICP programmed by using the FP100 programmer tool. By clicking the “Program “ icon, the target devices memory is erased, programmed and verified.

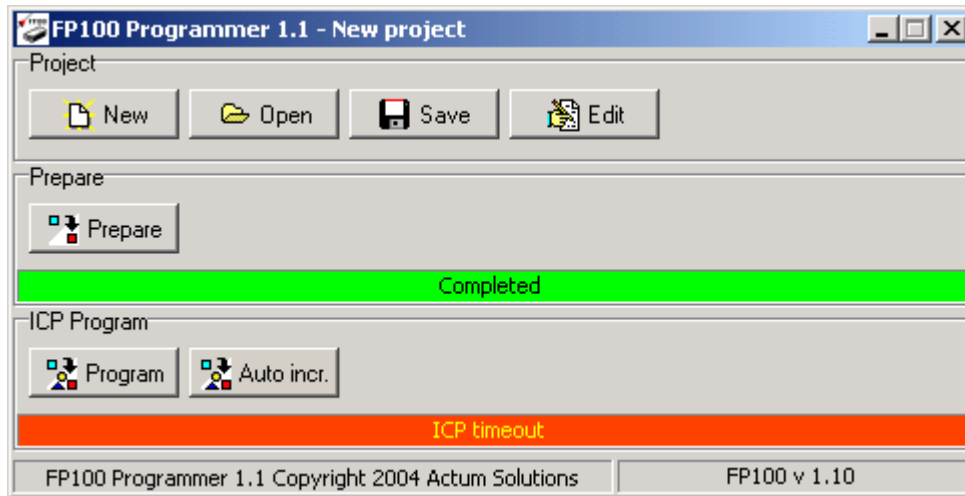
The progress is displayed with the progress bars, as illustrated in the window below. Note: the wired mode requires prepare.



When the programming cycle is completed successfully, the following window will appear.



When an error occurred during this ICP programming stage, it will be illustrated as follows on your screen.

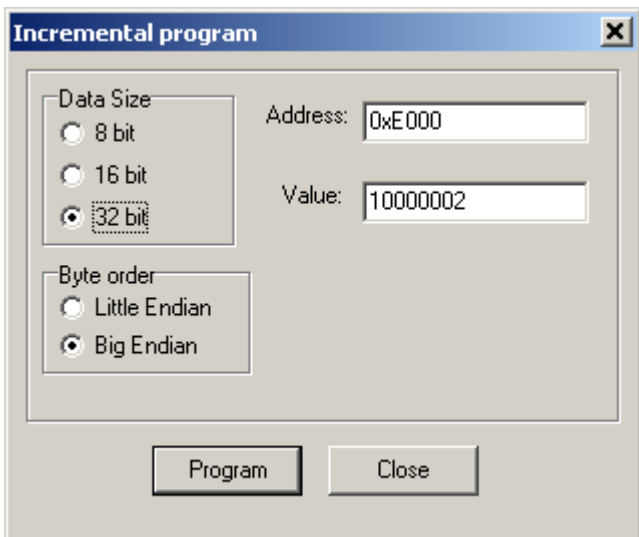


This can mean that the target device is not connected correctly or may be even defective. Try to check whether the ICP connector on the target board is conform the STMicroelectronics® specifications. These specifications are given in the next chapter.

#### Wired mode incremental programming

The FP100 has the possibility to program a serial number into the device while programming the device. This serial number will be incremented on every successful programming cycle.

When selecting *Auto Incr* button, you will get a dialog window to enter the properties:



You select the size of the serial number, the byte order, address and current value.

When you press program, a normal programming cycle is started, after successful completion the incremental program window is shown again, with an incremented value.

### Detached mode.

In this mode, the FP100 (with the target software in its memory) is disconnected from the PC and transported (handed over, shipped etc) to the target device. There, the target device is programmed without the need of a PC or the FP100 programming software.

The ICP connector of the FP100 programmer is used to program the target device. The target device has to power the FP100 programmer through the ICP connection. The green "power LED" of the FP100 gives an indication of the supply voltage.

Then, by simply pressing the START switch on the FP100, the target device is erased, programmed and verified. The progress of this process or possible errors can be followed with the LED indicators on the FP100.

More detailed information about the ICP connector, switches and LED indications, can be read in the following chapter.

### **FP100 hardware overview.**

#### USB connector

The FP100 provides a "type B" USB plug for connection to the host PC and is in accordance to the USB standard. The power to the FP100 can be supplied through the USB bus (max. 200mA in operating mode)

#### ICP connector

The FP100 provides an IDC plug (10 way) for ICP (In Circuit Programming) programming of STMicroelectronics® micro-controllers. The pin assignment on this connector is in accordance to the ICP standard set by STMicroelectronics®. A pdf document specifying this standard is available from our web site as well.

An overview of this standard is provided in the table below.

Pin	Signal name	Description
1	GND	Ground
2	ICPDATA	ICP input/output serial data pin
3	GND	Ground
4	ICPCLK	ICP output serial clock pin
5	GND	Ground
6	/RESET	Device reset
7	VCC	Power supply of the target controller
8	VPP	Programming voltage
9	OSCIN	Main clock input for external source
10	GND	Ground

The target board (board which has to be programmed using the FP100) will have to meet the specifications above for correct operation.

## Status LEDs on the FP100

A description of the power and status LEDs is shown in the table below:

LED	Status	Description
POWER (green)	On	Power is applied to the FP100. Either via USB or ICP connection.
	Off	No power is applied to the FP100.
PROG. (yellow)	Off	FP100 is ready to program the target controller.
	Blinking (at. 2Hz)	The FP100 is erasing the target controller.
	Blinking (at. 4Hz)	The FP100 is programming the new software into the target controller.
	Blinking (at. 10Hz)	The FP100 is verifying the software into the target controller.
ERROR (red)	On	Target controller programmed successfully.
	On	An error occurred during programming
	Off	All is OK.

## Switches on the FP100

A description of the switches on the FP100 is shown in the table below:

Switch	Description
START	Starts a programming session .
CLOSE	Closes a (un)successful programming session.